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REPORT

"USE OF A HEALTH QUESTIONNAIRE AS A SCREENING INSTRUMENT FOR STATE EMPLOYEES"

GRANT NO. 29424 (CH 40-88)
COMMUNITY HEALTH SERVICES
U. S. PUBLIC HEALTH SERVICE

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I. INTRODUCTION

The project, "Use of a Health Questionnaire as a Screening Instrument for State Employees," Grant No. 29424, was begun June 1, 1967 and terminated December 31, 1969. It was funded by the United States Public Health Service and it was extended six months with no extra funds. This was necessary due to the difficulty in recruiting sufficient qualified staff to complete the screening in the previously planned time schedule.

The project was cleared with the Council for Scientific Advancement of the Pennsylvania Medical Society.

The initial screening of the 3077 employees of the Pennsylvania Department of Health began in October, 1967 and terminated June, 1969. This included all employees in Central Office, Harrisburg, State Laboratory in Philadelphia, the three Tuberculosis Hospitals in Philadelphia, Pittsburgh and South Mountain (South Mountain was screened prior to being transferred to the Department of Welfare), Crippled Children's Hospital in Elizabethtown and the Six Human Service Regions of the Department of Health.

NEED AND BACKGROUND

An employee health service for all State employees is administered by the Employee Health Service of the Division of Occupational Health of the Pennsylvania Department of Health.

The services offered are largely emergency in nature. More complete examinations are done on some employees over 55 years of age.

Studies and demonstrations[1] have shown in various parts of the United

States that many apparently well persons have incipient, unrecognized chronic illnesses or disabilities. Groups examined have differed widely in their economic, ethnic, and cultural characteristics as do the employees of the Pennsylvania Department of Health.

The current shortage of physicians encourages already busy physicians to concentrate on healing the sick and providing lifesaving services to acutely ill persons.

This produces a climate that is not conducive to the commitment of a significant percentage of scarce medical man-hours to devote to the examination of the apparently well person.

Data suggests that health education techniques have not succeeded in motivating a significant number of employees of the State Health Department to seek and pay for physical examinations from their own physicians. The reasons that lie behind the employees attitude is very important in this study. Why the employee feels as he does toward preventive medicine is an important factor.

In the past, health questionnaires have been found useful in a variety of circumstances[2] in hospital practice, in insurance work, in schools, in medical teaching, in medical and psychological research, in industry, and in the performance of periodic health examinations. Could the use of a health questionnaire motivate employees to seek a physical examination when the questionnaire suggested the possibility of illness?

Just how useful and helpful it would be in improving health services to all Pennsylvania Department of Health employees was to be determined by this project.

GENERAL DESCRIPTION OF PROJECT OPERATION

In planning for the screening operation of the project it was necessary to structure the project operations so that pertinent information and data relevant to the objectives of the study would be obtained.

1. Project Objectives

a) To determine by age group the amount of undiagnosed and untreated chronic illness and disability that may be detected among a group of State employees using the Cornell Medical Index as an initial screening device.

b) To determine the educational value of this type of screening program in motivating State Health Department employees to seek medical care.

c) To determine the costs involved in using the Cornell Medical Index (C.M.I.) as a pre-screening device.

d) To determine the reactions of a group of State employees to the use of the C.M.I. as a screeing device.

2. Staff

It was decided to have a full-time staff of a Project Supervisor, Nurse and Clerk-Stenographer. However, this was not possible due to recruitment difficulties. The Project Supervisor remained with the project for nine months, after which the Project Nurse became the Project Supervisor and completed the screening operations.

Others devoting time to the project were the Project Director, Associate Project Director, Research Sociologist, Public Health Nursing Consultant, Administrative Officer and a Biostatistician.

During the last eight months of the project's operations, the part-time services of a Medical Research Technician was used to assist in the coding of the Attitude questionnaire and in the conferences to be held with a random sample of participants and non-participants to determine their reactions to this type of a screening program.

3. Supporting Materials and Persons Used

A news article was published in the October, 1967 issue of the "Health Highlights," the monthly publication of the Pennsylvania Department of Health. This explained what the project hoped to accomplish and the benefits the employee could derive from his participation in the program.

Since it was felt that the Supervisory Personnel could prove of assistance in promoting the program, the C.M.I. staff met with the Regional Nurses and the Regional Health Educators at a meeting in the Central Office in Harrisburg, prior to the screening process. The Supervisory Personnel proved to be an asset in both the planning and scheduling for the screening of their employees. These persons were familiar with the problems that could be encountered in in the screening of their personnel. In most cases, these people proved to be an asset in promoting this project.

A brochure, Form I, was prepared which answered questions as to what a C.M.I. Questionnaire was and what it would accomplish. In addition, the brochure gave a brief description of why it would be advantageous to participate in the program. The forms were distributed by the Supervisory staff prior to the scheduled screening to familiarize the employee with the program.

4. Forms Used and Methods of Procedure

(Copies of all forms discussed are contained in the Appendix of this report)

Prior to the screening, a C.M.I. card, Form 2, was completed by the C.M.I. staff with information received from the Personnel Department.

The information received from the Personnel Department and from the completed questionnaire proved very useful in the collection of statistical information necessary for the project. All information obtained from the questionnaire was placed on the participant's card by the Project Nurse and the file kept confidential. A card file was also maintained for non-participating employees.

Two questionnaires were used in this study. One, the Attitude Questionnaire, prepared by the Division of Behavioral Science, to determine the attitudes of participants toward the screening programs and preventive medicine. The employees' attitudes were considered quite important in this study. The second, a Cornell Medical Index Health Questionnaire was used for the medical screening. This questionnaire was devised by the Cornell Medical College to detect hidden illness in persons. It had already been proven an effective screening device.[3] As will be noted later in this study, it proved accurate with the physicians' reported findings.

Meetings were held with the Bureau Directors in Central Office, the Medical Directors of the Institutions and Human Services Regions prior to the anticipated screening of their employees. The program was discussed and plans were made with the Director's designee for the scheduled screening of the Bureau, Institution or Health Center.

A meeting was held with the Department of Health employees at the scheduled times to discuss and answer questions regarding the program. The program was offered to all Pennsylvania Department of Health employees who volunteered to participate. Each employee was given an index number and each one was instructed not to place his name on the questionnaire. The name and number combination was known only to the Project Supervisor. The questionnaire was completed by each participant at his convenience. The C.M.I. Questionnaires were reviewed and each participant was notified of the results.

If a suggestive illness was indicated, a Release of Information, Form III, was completed by the participant if he desired a copy mailed to his personal physician; however, others completed the form with the questionnaires. Some preferred to wait and complete it later if the questionnaire was suggestive of illness. Participants without a family physician completed the form later after deciding upon a physician. A few made it very clear that they would not seek medical attention.

A copy of the questionnaire plus Form IV, V and VI were mailed to the physician and the participant was encouraged to have a medical examination.

After the participant had a medical examination, the physician was asked to return Form VI with the index number only in the envelope provided.

If no report was received from the physician within a reasonable time an inquiry Form VII was mailed to the employee. When this form was returned it indicated to us why a report had not been received and where the negligence laid. If the employee stated that he had a medical examination, a short inquiry was again mailed to the physician. This proved worthwhile in some instances.

Records were kept on the Card Form II and statistics were compiled. Results have been tabulated and are shown later in this report.

II. SCREENING

CENTRAL OFFICE

There are seven Bureaus in the Central Office, Harrisburg, located in the Health and Welfare Building. The initial screening of the 624 employees began in October, 1967. It was decided to begin in our own Bureau, the Bureau of Planning, Evaluation and Research, where it was proved that our planning for the screening would be feasible.

Arrangements were made with the Bureau and Division Directors for the screening of their employees at their convenience. Meetings were held with small groups of employees in their own work area wherever possible. It was found the employees preferred this to going to the conference room for the meeting. The participation rate was greater when the employee was approached in his own work area.

Another factor that influenced the rate of participation was the attitude of the supervisory personnel. In the Divisions where the supervisory staff approved of the screening program and felt it was worthwhile and they themselves participated, the rate of participation was better than where no interest was shown in the program by the supervisors. In some areas one person influenced the entire group.

Some expressed the idea that they were feeling fine and saw no need to participate since they saw a physician only when they didn't feel well. Others stated they were under the care of a physician and they saw no need to participate. Some employees completed the questionnaire even though they were under a physician's care at the time. Several stated that after seeing their physician he expressed concern since they had never mentioned all of the symptoms to him. It appeared that the participant was not aware of its importance. Some who completed the questionnaire indicated they benefited from the program even though they were under the care of a physician at the time.

In the Central Office participants were notified of CMI results either verbally or in writing. Interviews were held in private with those who were interested in discussing the results further. In this way it was possible to determine if the suggested illness was new or one the employee was aware of previous to the screening. Another accomplishment of the interview was that an individual was often persuaded to give permission to have a copy of his questionnaire mailed to his personal physician. He in turn had a physical examination although previous to the screening he had not planned to have one.

However, in spite of the educational program 21% of those indicating a suggestive illness refused to have their questionnaires mailed to a physician and have a physical examination.

It was decided that for those who had no personal physician and if they wished to do so, Dr. W. W. Wendling, Chief of Employee Health Services, would see them and give them a physical examination. A few took advantage of this opportunity. Every effort was made to stress the importance of having regular physical examinations.

In the Central Office with 624 employees it took nearly seven weeks to administer the questionnaires, an average of 18 questionnaires per day or 90 per week. Although all the employees were at one geographical location, the length of time required to administer the questionnaires may be attributed to the number of supervisors to be contacted, the time required to organize the screening schedules, and the variation in the size of the divisions.

SCREENING STATISTICS OF CENTRAL OFFICE

Employees	Refusals	Screened	Negative CMI	Positive CMI	Positives Refusing Referral	Positives Referred to Physicians	Returns from Physicians	Positive Physician Return
624	189	435	364	71	17	54	37	37
Males								
243	78	165	152	13	4	9	5	5
Females								
381	111	270	212	58	13	45	32	32

STATISTIC PERCENTAGES OF SCREENING
OF
CENTRAL OFFICE

Percent of Employees Screened	Percent of Screened Employees with Positive CMI	Percent with Positive CMI Referred to Physician	Percent of Physician Returns Confirming CMI Diagnosis
69.7	16.3	76.1	100.0

TABLE I

INSTITUTIONS

The screening of the 1381 employees of the three tuberculosis hospitals, the Crippled Children's Hospital in Elizabethtown, and the State Laboratory which was included in this category for convenience began February, 1968. Each institution was different in the approach to the program.

A meeting was held with the Medical Directors and Business Managers of the institutions to discuss the program. After this meeting the Business Managers discussed the program with the supervisory staff of all the various departments and arrangements were made for the screening.

Meetings were held at hourly intervals with groups of 10 to 40 employees.

It was necessary to hold meetings from 11 p.m. to 1 a.m. to accommodate employees working on the night shift.

The one problem encountered in the institutions that was not found in the Central Office or the Human Services Regions was the lack of education of the employees. It was necessary to read and complete the questionnaire for employees who were illiterate. Some had difficulty comprehending certain terms on the questionnaire and further explanation at their level of understanding was necessary. It appeared these had more difficulty with the completion of the Attitude Questionnaire than they did with the Cornell Medical Index Health Questionnaire. This factor should perhaps be kept in mind when planning for screening programs for the general public.

Here again participation was better if the supervisory personnel felt the screening could be beneficial. Another factor noted was that at the institutions where everyone attended the meetings participation was better than at those where everyone was not required to attend. After hearing the discussion additional individuals decided it could be beneficial to them to participate.

At the institutions the results of the screening were distributed by the supervisory staff in separately sealed individual envelopes with the employees pay checks. Every effort was made not to inconvenience the employees.

Several days were spent at each institution holding private interviews with the employees. A view expressed by many of the lower income bracket employees was that they found it financially impossible to have frequent medical examinations. However, they agreed it was a good idea and felt it should be done. This again demonstrates the need for more health services to be made available to those in the lower income brackets.

Originally it was planned to release the results to the Medical Directors of the Institutions and Human Services Regions. This idea was abandoned when the employees expressed concern and disapproval. Many felt that this method of releasing the information might jeopardize their job. Perhaps improved interpersonal relationship between the Medical Directors and their employees should be developed.

SCREENING STATISTICS OF INSTITUTIONS

Employees	Refusals	Screened	Negative CMI	Positive CMI	Positives Refusing Referral	Positives Referred to Physicians	Returns from Physicians	Positive Physician Return	Reported Under Treatment
1453	482	971	706	265	213	52	22	20	103
Males									
592	226	366	281	85	69	16	6	5	35
Females									
861	256	605	425	180	144	36	16	15	68

STATISTIC PERCENTAGES OF SCREENING
OF
INSTITUTIONS

Percent of Employees Screened	Percent of Screened Employees with Positive CMI	Percent with Positive CMI Referred to Physician	Percent of Physician Returns Confirming CMI Diagnosis
66.4	26.1	31.6	80.8

TABLE II

HUMAN SERVICES REGIONS

There are six Human Services Regions in the Pennsylvania Department of Health with 1072 employees. The regional offices are located in Philadelphia, Pittsburgh, Kingston, Harrisburg, Williamsport and Meadville. Health Centers are located in each county. The number of employees headquartered at each health center varies.

The initial screening of the Human Services Regions began in May, 1968. After a meeting with the Regional Medical Director, a schedule for the screening of the employees in the region was arranged. Schedules had to be planned to screen the nurses and sanitarians because their duties were primarily in the field. The attitude of supervisory personnel in the regional offices strongly influenced the rate of employee participation.

Source of the reasons given by employees for not participating in the screening program were:

1. The employee was already under the care of a physician.
2. The questions were too personal in nature.
3. The employee made it a habit of having a yearly physical.
4. The examination wasn't compulsory.
5. "I know there is nothing physically wrong with me."
6. Some employees were aggrieved by their employer.

Some employees doing field work most of the time found it difficult to complete the questionnaires immediately following the initial discussion. Subsequently those who wished to participate completed the questionnaire at their own convenience and mailed it to the Cornell Medical Index Health Questionnaire office in Harrisburg. Others who found it impossible to be present for the discussion but wished to participate followed the same procedure.

After the results of the screening using the Cornell Medical Index Health Questionnaire were reviewed they were mailed directly to the employee's home address. Follow-up telephone calls were made to those whose questionnaires suggested the presence of an illness.

Originally it had been planned to employ nurses locally to assist in the follow-ups, but due to the shortage of qualified personnel to orient the nurses to the program this idea was abandoned. Instead follow-ups were done by the project supervisor by mail or telephone. This proved to be as effective.

Many miles of travel were involved in contacting the 1072 employees in the six regions. Sixty-two County Health Centers, two district offices, and six regional offices were visited. In spite of all the travel involved it was possible to administer 25 questionnaires per day, or 125 per week. From one to three counties were covered per day depending on the distances involved and the location of employees.

SCREENING STATISTICS OF HUMAN SERVICE REGIONS

Employees	Refusals	Screened	Negative CMI	Positive CMI	Positives Refusing Referral	Positives Referred to Physicians	Returns From Physicians	Positive Physician Return	Reported Under Treatment
1071	330	741	578	163	124	39	14	13	102
Males									
410	159	251	207	44	35	9	3	3	25
Females									
661	171	490	371	119	89	30	11	10	77

STATISTIC PERCENTAGES OF SCREENING
OF
HUMAN SERVICE REGIONS

Percent of Employees Screened	Percent of Screened Employees with Positive CMI	Percent with Positive CMI Referred to Physician	Percent of Physician Returns Confirming CMI Diagnosis
69.2	22.8	21.4	97.1

TABLE III

MEDICAL CONDITIONS REPORTED BY PHYSICIANS ACCORDING TO AGE

DIAGNOSIS OR CONDITIONS	AGE OF EMPLOYEE					
	Total	19-30	31-45	46-55	56-65	66 & Over
Diseases of Cardiovascular System	32	3	4	8	15	2
Hypertension	14	1	3	5	4	1
Arterio-Sclerotic Heart Disease	4	0	1	0	2	1
Coronary Artery Disease	1	0	0	0	1	0
Others	13	2	0	3	8	0
Diseases of Respiratory System	24	7	5	6	6	0
Emphysema	5	0	0	4	1	0
Chronic Bronchitis	5	2	2	1	0	0
Chronic Sinusitis	7	3	2	0	2	0
Others	7	2	1	1	3	0
Diseases of the Gastro-Intestinal System	32	4	10	7	8	3
Colon Diseases	6	1	3	1	1	0
Stomach Diseases	13	2	4	2	3	2
Liver Diseases	4	0	0	2	1	1
Others	9	1	3	2	3	0

TABLE IV

MEDICAL CONDITIONS REPORTED BY PHYSICIANS ACCORDING TO AGE (CONT'D)

DIAGNOSIS OR CONDITIONS	AGE OF EMPLOYEE					
	Total	19-30	31-45	46-55	56-65	66 & Over
Diseases of the Muscoskeletal System	11	0	3	6	1	1
Arthritis	6	0	1	3	1	1
Others	5	0	2	3	0	0
Diseases of the Genito-Urinary System	21	7	5	7	1	1
Urinary System Diseases	10	2	2	4	1	1
Genital System Diseases	11	5	3	3	0	0
Psychological Disorders--Neurosis & Psychoneurosis	34	11	10	8	5	0
Diseases of the Eyes & Ears	5	1	3	1	0	0
Diseases of the Eyes	2	0	1	1	0	0
Diseases of the Ears	3	1	2	0	0	0
Blood Diseases	5	1	2	1	1	0
Diseases of the Endocrine System	10	1	3	2	3	1
GRAND TOTALS	174	35	45	46	40	8

TABLE IV (CONT'D)

III. PARTICIPATION IN THE CMI SCREENING PROGRAM

Special efforts were put forth to promote and explain the advantages of the CMI screening program but only 67.5 percent of the eligible employees participated to the extent of completing questionnaires. Women, with a participation rate of 71.0 per 100 female employees were more cooperative than men (62.1 per 100 male employees).

Participation of Pennsylvania Department of Health Employees in the CMI Screening Program

Sex	Employees	No. Non-Part.*	Part.*	Employees	Pct. Non-Part.*	Part.*
Both Sexes	3,077	1,001	2,076	100.0	32.5	67.5
Male	1,221	463	758	100.0	37.9	62.1
Female	1,856	538	1,318	100.0	29.0	71.0

Four hundred and twenty-eight, or 20.6 percent, of the 2,076 completed questionnaires were suggestive of health problems (positive CMI). Of the questionnaires completed by women, 23.5 percent were positive while 15.6 percent of those completed by men were positive.

CMI Questionnaire Results: All Participating Employees

	Number			Percent		
Sex	Screened	Negative	Positive	Screened	Negative	Positive
Both Sexes	2,076	1,648	428	100.0	79.4	20.6
Male	758	640	118	100.0	84.4	15.6
Female	1,318	1,008	310	100.0	76.5	23.5

Although 428 of the tests indicated health problems only 65 were actually confirmed by physicians. This low yield of confirmed-positive CMI's can be related more to a failure of the educational and persuasive techniques employed (to get individuals suspected of being ill to see a

*Participating

doctor) than to a lack of validity of the CMI as a diagnostic tool. Eighty-nine percent of the 73 physician returns did confirm, at least in part, the CMI findings. On the other hand, 275 employees refused, for various reasons, to even permit the results to be mailed to physicians. Another 24 allowed the information to be mailed but indicated they would not get a physical examination. Thus, nearly 70 percent of the total number of individuals suspected of having some illness or condition refused to cooperate beyond the point of completing a questionnaire. One employee died and two left State service before they could be informed of the test results bringing the number of positives definitely lost to the program to 302.

Copies of 150 questionnaires were sent to physicians. As indicated, 24 employees whose questionnaires were suggestive of conditions requiring medical attention stated they would not seek it. Seventy-three physician forms were returned and six individuals stated that they had seen physicians but no physician reports were ever received. It could not be determined if any of the remaining 47 employees ever saw a doctor in spite of efforts to contact individuals and physicians alike.

It was primarily this attrition, this continuing loss of employees to the program at each phase cooperation was asked, which resulted in a confirmed-positive rate of only 2.1 per 100 employees. If participation in the program were mandatory, it is conceivable that (based on the positive rate of 20.6 per 100 participants and the confirmation rate of 89.0 per 100 positives, the confirmed-positive rate would have been in excess of 18 percent. Of course, it is not known that those individuals who followed through are representative of the total population of employees so this is merely hypothetical.

It is of interest that although only 65 CMI diagnoses could be established by medical confirmation 207 other individuals stated that they were either aware of or under treatment for the indicated conditions. This affirmation of findings, however, may have been a device used by employees to dissuade the nurse from pressing for a physical examination. A surprisingly large number of those who refused to grant permission for questionnaires to be mailed indicated that they were already under treatment, 154 of 275, while another 50 stated that they were aware of the condition. Only three of those who allowed the questionnaire to be mailed made such a statement. If such statements could be construed as confirmation of CMI diagnosis the confirmed rate, including physician-confirmed diagnoses, for the 425 eligible positives (excluding those no longer employed by the State) would be 64.0 rather than 15.3 percent.

It was not the primary purpose of this project to validate the CMI. This has been done numerous times in the past. Rather, it was considered more important to determine if it could be utilized effectively in a governmental setting with voluntary participation. In view of the results obtained, such a program is not economically feasible unless some means can be developed to impress on employees the value of such a screening program and the importance of medical follow-up. Consider the facts. One-third of the employees refused to participate at all; 64.7 percent of those with suggestive findings would not permit the questionnaires to be mailed to a physician; and another 5.6 percent, while signing transmittal forms, stated that they would not seek a physical examination. Considering only individuals with suggestive findings (positives) and using as a criterion of sufficient participation in the program not only confirmed-positives but all physician visits and also the granting of permission to mail questionnaire results (excluding examination refusals) only 126 or 29.6 percent of the 425 eligible positives could be viewed as having actively taken part in the program.

Follow-up of Health Department Employees with Suggestive CMI Findings

1. Refused to have CMI mailed to physician	275
a. "Aware of condition"	50
b. "Under treatment for condition"	154
c. No reason noted	71
2. CMI mailed to physician	150
a. No physical examination	24
(1) "Aware of condition"	-
(2) "Under treatment for condition"	-
(3) Refused, no reason noted	24
b. Physical examination	79
(1) CMI diagnosis confirmed	65
(2) CMI diagnosis not confirmed	8
(3) No physician return	6
c. Physical examination; status unknown	47
(1) "Under treatment for condition	3
(2) No information available	44
3. Died or left State employment	3
Total employees with suggestive CMI findings	428

PARTICIPATION IN THE CMI SCREENING PROGRAM: CENTRAL OFFICE

In the Central Office, 69.7 percent of the 624 employees completed CMI questionnaires with 67.9 percent of the male and 70.9 percent of the female employees participating.

Participation of Central Office Employees in the CMI Program

Sex	Employees	No. Non-Part.*	Part.*	Employees	Pct. Non-Part.*	Part.*
Both Sexes	624	189	435	100.0	30.3	69.7
Male	243	78	165	100.0	32.1	67.9
Female	381	111	270	100.0	29.1	70.9

Seventy-one of the 435 completed questionnaires were suggestive of some illness or condition. This rate of 16.3 per 100 screened employees was somewhat less than the positive rate of 20.6 per 100 of all screened Department of Health employees. The positive CMI rate for participating Central Office males was only about one-half that for all participating males, 7.9 versus 15.6 percent. The female rate of 21.5 percent was only slightly lower than the rate of 23.5 for all participating females.

CMI Questionnaire Results: Central Office Employees

	Number			Percent		
Sex	Screened	Negative	Positive	Screened	Negative	Positive
Both Sexes	435	364	71	100.0	83.7	16.3
Male	165	152	13	100.0	92.1	7.9
Female	270	212	58	100.0	78.5	21.5

Thirty-four of the 37 physician report forms returned confirmed the suggested CMI diagnosis; a confirmed positive rate of 91.9 per 100 returns.

*Participating

A total of 54 questionnaires were mailed to physicians but fifteen employees refused to have a physical examination. Three CMI diagnoses were not confirmed and two physicians failed to return report forms. Fifteen or 21.1 percent of the positives refused referral to their personal physicians. One employee died and another left the State before notification of CMI results could be accomplished.

Utilizing the criterion for sufficient participation by positives established previously, 54.9 percent of the eligible Central Office positives actively took part in the program. The comparable rate for all eligible Department of Health positives was only 29.6 percent.

Follow-up of Central Office Employees with Suggestive CMI Findings

1. Refused to have CMI mailed to physician	15
a. "Aware of condition"	-
b. "Under treatment for condition"	3
c. No reason noted	12
2. CMI mailed to physician	54
a. No physical examination	15
(1) "Aware of condition"	-
(2) "Under treatment for condition"	-
(3) Refused, no reason noted	15
b. Physical examination	39
(1) CMI diagnosis confirmed	34
(2) CMI diagnosis not confirmed	3
(3) No physician return	2
c. Physical examination; status unknown	-
(1) "Under treatment for condition"	-
(2) No information available	-
3. Died or left State employment	2
Total employees with suggestive CMI findings	71

PARTICIPATION IN THE CMI SCREENING PROGRAM: INSTITUTIONS

Of the 1,381 institutional employees eligible to participate in the program, 899 or 65.1 percent completed CMI questionnaires. The proportion participating ranged from 45.6 percent at Landis State Hospital to 76.3 percent at the Samuel F. Dixon State Hospital. In general, female participation rates were greater than those for males. Exceptions, however, were the State Laboratory where 74.3 percent of the males and 69.2 percent of the females participated and Landis State Hospital where the respective figures were 45.9 and 45.1 percent. At Samuel Dixon Hospital, 86.5 percent of women participated in the program. This was the best participation record of any institutional group.

Participation of Institutional Employees in the CMI Screening Program

Institution and Sex of Employee	Number			Percent		
	Employees	Non-Part.*	Part.*	Employees	Non-Part.*	Part.*
All Institutions	1,381	482	899	100.0	34.9	65.1
Male	568	226	342	100.0	39.8	60.2
Female	813	256	557	100.0	31.5	68.5
Laboratory-Phila.	87	25	62	100.0	28.7	71.3
Male	35	9	26	100.0	25.7	74.3
Female	52	16	36	100.0	30.8	69.2
Elizabethtown Hosp.	247	101	146	100.0	40.9	59.1
Male	75	35	40	100.0	46.7	53.3
Female	172	66	106	100.0	38.4	61.6
Landis Hospital	340	185	155	100.0	54.4	45.6
Male	133	73	60	100.0	54.9	45.1
Female	207	112	95	100.0	54.1	45.9
Marcy Hospital	306	76	230	100.0	24.8	75.2
Male	132	42	90	100.0	31.8	68.2
Female	174	34	140	100.0	19.5	80.5
Dixon Hospital	401	95	306	100.0	23.7	76.3
Male	193	67	126	100.0	34.7	65.3
Female	208	28	180	100.0	13.5	86.5

*Participating

Of the 899 completed questionnaires, 193 were positive for possible health problems. This rate of 21.5 per 100 screened was considerably higher then the Central Office rate of 16.3 and slightly higher than the 20.6 noted for all employees screened. With the exception of Samuel Dixon Hospital which had a rate of 14.1 per 100 screened employees, the institutional positive rates were fairly consistent. Marcy and Landis Hospitals had the highest positive rates; 27.8 and 27.1 per 100, respectively.

Samuel F. Dixon Hospital not only had the lowest positive rate but it was the one institution where the male rate was higher than the female, albeit slightly. Female positive rates at the State Laboratory and Marcy and Landis Hospitals were at least 30 per 100 screened employees. Rates for males were considerably lower.

CMI Questionnaire Results: Institutional Employees

Institution and Sex of Employee	Number			Percent		
	Screened	Negative	Positive	Screened	Negative	Positive
All Institutions	899	706	193	100.0	78.5	21.5
Male	342	281	61	100.0	82.2	17.8
Female	557	425	132	100.0	76.3	23.7
Laboratory-Phila.	62	48	14	100.0	77.4	22.6
Male	26	23	3	100.0	88.5	11.5
Female	36	25	11	100.0	69.4	30.6
Elizabethtown Hosp.	146	116	30	100.0	79.5	20.5
Male	40	34	6	100.0	85.0	15.0
Female	106	82	24	100.0	77.4	22.6
Landis Hospital	155	113	42	100.0	72.9	27.1
Male	60	48	12	100.0	80.0	20.0
Female	95	65	30	100.0	68.4	31.6
Marcy Hospital	230	166	64	100.0	72.2	27.8
Male	90	68	22	100.0	75.6	24.4
Female	140	98	42	100.0	70.0	30.0
Dixon Hospital	306	263	43	100.0	85.9	14.1
Male	126	108	18	100.0	85.7	14.3
Female	180	155	25	100.0	86.1	13.9

Although the proportions of Central Office and Institutional employees who agreed to complete CMI questionnaires are fairly comparable (69.7 and 65.1 percent, respectively) there was a marked difference in the proportion of positive employees who refused to cooperate beyond this point. Twenty-one percent of the Central Office employees with positive CMI's refused to have the results forwarded to personal physicians. For Institutional employees, however, this figure was 74 percent. Only 24.4 percent of the Institutional employees screened-out for possible illness permitted the questionnaires to be mailed to physicians (excluding those who indicated they would not see a doctor). The comparable figure for Central Office positives was 54.9 percent.

The percentage of positives confirmed by physicians was slightly lower in the institutions than in the central office; 86.4 as compared to 91.9 percent.

Follow-up of Institutional Employees with Suggestive CMI Findings

1. Refused to have CMI mailed to physician	143
a. "Aware of condition"	18
b. "Under treatment for condition"	80
c. No reason noted	45
2. CMI mailed to physician	50
a. No physical examination	3
(1) "Aware of condition"	-
(2) "Under treatment for condition"	-
(3) Refused, no reason noted	3
b. Physical examination	26
(1) CMI diagnosis confirmed	19
(2) CMI diagnosis not confirmed	3
(3) No physician return	4
c. Physical examination status unknown	21
(1) "Under treatment for condition"	-
(2) No information available	21
3. Died or left State employment	-
Total employees with suggestive CMI findings	193

PARTICIPATION IN THE CMI SCREENING PROGRAM: REGIONAL EMPLOYEES

The proportion of Regional employees participating in the program (69.2 percent) was comparable to that of Central Office employees (69.7 percent). Participation rates for individual regions ranged from 52.6 per 100 employees in Region V to 84.2 in Region IV. Only 38 percent of the men in Region V participated in the program. In Region IV, 88.9 percent of the women completed CMI questionnaires. Region I was the only region where a larger proportion of men than women cooperated by completing questionnaires.

Participation of Regional Employees in the CMI Program

Region and Sex of Employee	Number			Percent		
	Employees	Non-Part.*	Part.*	Employees	Non-Part.*	Part.*
All Regions	1,072	330	742	100.0	30.8	69.2
Male	410	159	251	100.0	38.8	61.2
Female	662	171	491	100.0	25.8	74.2
Region I	131	44	87	100.0	33.6	66.4
Male	56	17	39	100.0	30.4	69.6
Female	75	27	48	100.0	36.0	64.0
Region II	282	91	191	100.0	32.3	67.7
Male	106	44	62	100.0	41.5	58.5
Female	176	47	129	100.0	26.7	73.3
Region III	113	34	79	100.0	30.1	69.9
Male	36	14	22	100.0	38.9	61.1
Female	77	20	57	100.0	26.0	74.0
Region IV	202	32	170	100.0	15.8	84.2
Male	67	17	50	100.0	25.4	74.6
Female	135	15	120	100.0	11.1	88.9
Region V	192	91	101	100.0	47.4	52.6
Male	79	49	30	100.0	62.0	38.0
Female	113	42	71	100.0	37.2	62.8
Region VI	152	38	114	100.0	25.0	75.0
Male	66	18	48	100.0	27.3	72.7
Female	86	20	66	100.0	23.3	76.7

*Participating

Scores on 164 of the 742 completed questionnaires were such as to warrant further communication with the employees concerning the conditions noted. The proportion positive, 22.1 percent, was practically identical to that noted for institutional employees. Female positive rates were consistently higher than the male rates, however, the range of differences varied from region to region. The positive rate for all regional female participants was 24.4 per 100 screened while for males it was 17.5. Region III males had the lowest positive rate, 19.1 per 100 screened, and women in Region I had the highest positive rate, 35.4.

CMI Questionnaire Results: Regional Employees

Region and Sex of Employee	Number			Percent		
	Screened	Negative	Positive	Screened	Negative	Positive
All Regions	742	578	164	100.0	77.9	22.1
Male	251	207	44	100.0	82.5	17.5
Female	491	371	120	100.0	75.6	24.4
Region I	87	63	24	100.0	72.4	27.6
Male	39	32	7	100.0	82.1	17.9
Female	48	31	17	100.0	64.6	35.4
Region II	191	161	30	100.0	84.3	15.7
Male	62	53	9	100.0	85.5	14.5
Female	129	108	21	100.0	83.7	16.3
Region III	79	60	19	100.0	75.9	24.1
Male	22	20	2	100.0	90.9	9.1
Female	57	40	17	100.0	70.2	29.8
Region IV	170	128	42	100.0	75.3	24.7
Male	50	39	11	100.0	78.0	22.0
Female	120	89	31	100.0	74.2	25.8
Region V	101	79	22	100.0	78.2	21.8
Male	30	24	6	100.0	80.0	20.0
Female	71	55	16	100.0	77.5	22.5
Region VI	114	87	27	100.0	76.3	23.7
Male	48	39	9	100.0	81.3	18.7
Female	66	48	18	100.0	72.7	27.3

Regional employees were more like Institutional than Central Office employees in not wanting to have CMI findings made available to personal physicians. Seventy-one percent of the Regional employees would not permit it. The same proportion of Regional and Institutional employees (excluding those who refused to be examined), 24.4 percent, permitted communication with personal physicians.

Only 14 physician report forms were received. Twelve of these confirmed the suggested CMI diagnosis, a confirmation rate of 85.7 per 100 returns.

One employee left State employment before he could be notified that his CMI suggested he might have a health problem. At the time the study was concluded, the physical examination status of 26 Regional employees could not be determined.

Follow-up of Regional Employees with Suggestive CMI Findings

1. Refused to have CMI mailed to physician	117
a. "Aware of condition"	32
b. "Under treatment for condition"	71
c. No reason noted	14
2. CMI mailed to physician	46
a. No physical examination	6
(1) "Aware of condition"	-
(2) "Under treatment for condition"	-
(c) Refused, no reason given	6
b. Physical examination	14
(1) CMI diagnosis confirmed	12
(2) CMI diagnosis not confirmed	2
(3) No physician return	-
c. Physical examination status unknown	26
(1) "Under treatment for condition"	3
(2) No information available	23
3. Died or left State employment	1
Total employees with suggestive CMI findings	164

IV - Reactions to Cornell Medical Index

Introduction

In order to determine the reactions of Health Department employees to the Cornell Medical Index (CMI) as a diagnostic and screening device, interviews were conducted with 94 Department employees. The interviews were structured and based on the questions in the interview schedule in Appendix . They were conducted in November and December of 1969. The primary objectives of this phase were: (1) to determine if Department employees had any difficulty understanding the Cornell Medical Index, (2) to determine if employees already were aware of any illnesses uncovered by the CMI and what they had done about them, (3) to determine reasons _for_ participating or _not_ participating, (4) to determine employees' opinion of self completed health inventories and whether they would participate again and (5) to determine employees' willingness to pay for preventive health service.

Sample

To obtain information for reaching the above objectives, a disproportionate stratified random sample of 100 employees in Central Office, Regions IV and V, and Elizabethtown Crippled Children's Hospital was selected. This excluded employees in Regions I, II, III and VI, Laboratories and two tuberclosis hospitals. This restriction was imposed because of limitations in interviewing manpower. However, it was felt that the two regions included could provide regional representation and that inclusion of Elizabethtown Crippled Children's Hospital would provide representation from an institutional setting.

Although 100 is a small number, it is, nevertheless, felt that some indication of reactions could be obtained with 100 interviews.

An attempt was made to allocate the 100 interviews somewhat in proportion to the 1,265 employees included in Central Office, Regions IV and V, Elizabethtown Crippled Children's Hospital, who were identified as having been asked to complete the Index. Since the Project Nurse and Physician were the only persons permitted to see records, the Project Nurse drew the sample following the outline prepared by the research unit of the project. Final allocation resulted in a slightly higher proportion being drawn from Regional personnel (38 percent in sample, 31 percent in total), and slightly lower proportions being drawn from Central Office (44 percent in sample, 49 percent in total) and the Hospital (18 percent in sample, 20 percent in total).

Since it was known before the sampling procedure was carried out that "positives" would in all likelihood comprise a smaller proportion of the total respondents than "negatives" or "non-participants," it was decided to over-sample the "positives" and under-sample "negatives" and "non-participants." Without doing this, it was felt that with a sample of 100 pure random selection could result in a very few "positives" being selected. Thus, it should be kept in mind that any statement made about the sample is biased towards responses of "positives." The number included in the sample for each administrative group, classified by type of participation in the project, is given in Table I below:

Table I - Distribution of employees in Central Office, Region IV and V, and Elizabethtown Crippled Children's Hospital, Total, and Study Sample, by Type of Project Participation.

	Central Office		Elizabethtown Crippled Children's Hospital		Regions IV and V		Total	
	Total	Sample	Total	Sample	Total	Sample	Total	No. in Sample of 100
Non-Participants	189	9	101	7	123	15	413	31
Negative	364	19	116	5	207	9	687	33
Participants refusing referral	17	3	7	3	49	8	73	14
Participants referred	54	13	23	3	15	6	92	22
Grand Total	624	44	247	18	394	38	1,265	100
Percentage Distribution of Total	49		20		31		100	
Number in Sample		44		18		38		100
Number Interviewed	41		15		38		94	

Interviewing

In all but three cases, the 94 completed interviews were conducted in an individual face-to-face setting. The three exceptions were telephone interviews, conducted in those cases where the person to be interviewed was located at considerable distance from project headquarters and could not be interviewed when other persons in his area of location were interviewed. There were two explicit refusals and two other names were randomly drawn from the appropriate category as replacements. Attempts were made until time of data analysis to interview the six persons who were finally omitted from analysis. Reasons were: parental death, accident victim, sick, vacation and in one case, sickness which eventuated in death.

Interviewing was done in the Central Office and Regions by a Behavioral Scientist and Research Associate, and in the Crippled Children's Hospital by a Research Technician.

Results

Recall of Participation Request

A total of 79 of the 94 respondents (84%) said they did recall being asked to complete a Cornell Medical Index (CMI) form. The 15 (16%) who said they did not recall completing the form, were located mostly in Central Office and Elizabethtown Crippled Children's Hospital (ECCH) - 6 persons each, and in Region V - 3 persons. All persons in Region IV recalled being asked to complete the form. Although not probed for in detail, reasons for lack of recall seemed to center on persons "lost" in job transfers or cases where "non-participants" said they could not recall completing a CMI rather than saying they could recall but did not participate. These insights (rather than definitive answers) were obtained from records and conversations.

Reasons for Participating

Of those who did recall being asked to complete the CMI, 64 said they agreed to do so, and 15 said they did not.

A distribution of responses to the question of why persons agreed to complete the CMI are given in Table 2. Where more than one reason was given by a respondent, the reason first mentioned was chosen. Thus, the total number of responses equals the number of persons interviewed.

Table 2 - Number and Percentage Distribution of Responses on Question of Why CMI Completed

Responses	Number	Percent
Concern with health	24	38
No particular reason, neutral type response	13	21
Expression of curiosity	7	11
To help research	6	9
General desire to cooperate	6	9
Perceived "coercion"	6	9
No information	2	3
Total	64	100

Examples of particular responses included in the various response categories are as follows:

Concern with health

"A very good idea, gives forewarning"

"To see if something might show up"

"I care about my health"

No particular reason, neutral type response

"Just to cooperate"

"Everyone else did"

"No reason for not cooperating"

Expression of curiosity

"Wanted to see if they could really tell"

"I was curious"

To help research

"To cooperate with any survey efforts"

"I go along with the Health Department, its research"

General desire to cooperate

"Belief in cooperation"

"Wanted to cooperate"

Perceived coercion

"Felt obligated to do so"

"Given to me to fill out"

As Table 2 indicates, over a third of those consenting to complete the CMI did so because they were concerned about their health. On the one hand, this can be viewed as a small percentage; yet on the other hand, the fact that more than a third saw the CMI as a way to find out something about their health seems an important finding for the project. The CMI was perceived as a technique for helping to improve health.

Most of the remaining responses do not require any elaboration. There is one, however, which should be noted, even if briefly. This is that concerning perceived "coercion." It was made clear to participants by the Project Coordinator and Project Nurse that participation was voluntary. Apparently, some supervisors either (1) misinterpreted this important point, or (2) felt that the CMI was so important that their people should participate. Another reason may have been that the supervisor thought low lack of participation might reflect on his or her ability as a supervisor. In any case, future efforts along this line might take stronger measures to insure that participation is voluntary, if that is stipulated as a condition of the project.

Reasons for Not Participating

As will be noted in Table 3, there was no predominant reason given for not participating in the project except that one third felt it was

Table 3 - Number and Percentage Distribution of Person's Reasons for Not Participating

Responses	Number	Percent
No time, too busy	4	27
Thought not necessary, saw no reason, not interested	5	33
Under physician's care	2	13
Miscellaneous, other	4	27
Total	15	100

not necessary, saw no reason to participate or were not interested. A somewhat less strongly negative response, but nonetheless, a response reflecting a low priority for the CMI was "too busy" or "no time," mentioned by 4 persons (27 percent). These two categories of responses accounted for well over one-half (60 percent) of the reasons for not participating.

Indicated Health Problems

A total of 27 of the 64 persons interviewed and who completed the CMI (42 percent) responded with a "yes" to the question of whether the CMI indicated they had any health problems. Although she could not disclose names or conditions, the Project Nurse was able to indicate that according to her records, 32 or 50 percent of the 64 were "positive." This discrepancy of 5 persons, it was found, was due to misinterpretation in at least 2 of the 5 cases. Two persons indicated that they knew the way they answered the CMI would cause them to be labeled "positive." Both of these persons were well aware of their present health status and had been regularly seeing a physician. They said that when in doubt, they leaned more toward a response category which would give a "positive" reading. They went to their respective physicians as suggested by the Project Nurse and found nothing was actually amiss. They were basically false "positives." The other three cases may have been similar situations and respondents never thought of the results of the CMI as indicating a health problem.

A very high percentage of those indicating they were identified as as "positive" (82 percent or 22 persons) said they were already aware of their illness which meant that of the sample interviewed, only 5 persons or 18 percent of the respondents learned of new and unknown problems.

When those aware of their illness were asked if they had been under treatment for the problem or problems, 14 of the 22 (64 percent) said "yes." Thus, about one-half (52 percent) of the total of 27 persons who were initially identified as having a problem were receiving treatment; the other half were not. This finding that about one-half of those with suggested illness were not doing anything about the problem is significant, when we note that there were a total of 425 identified "positives" in the project.

There was considerable difference by location with the percentage for Central Office and Elizabethtown Crippled Children's Hospital being 38 percent and that for the regions being 73 percent.

Contact with Physician

Seven persons or 26 percent of the 27 identified "positives," said they had contacted a physician. This ratio compares favorably to the percentage of all "positives" in the project who accepted referral. This latter percentage was 29 percent. It should be kept in mind there was a slight difference in the stimulus for responding--the interviewer asked if they had contacted a physician, and did not ask whether they consented to referral.

Of the 19 persons indicating they did not contact a physician, and on whom information as to reason for not participating was available, 12 or 63 percent said they were already under the care of a physician, presumably for the illness indicated in the CMI. However, this is an unknown factor since this question was not pursued. It was agreed ahead of time that the purpose of the interview was not to get into medical topics. Three of the 19 said they did not think the problem identified was serious enough to warrant a physician's visit. Other reasons were: "too busy," "don't know," and "procrastination." There was no information in one case.

If we consider the twelve persons who said they already were under care of a physician, along with the seven who said they went to a physician as suggested, we find that the total number of persons having some contact with a physician about the possible illness is increased to nineteen out of the 26 (73 percent) on which information was available. In other words, almost three-fourths of the identified "positives" were already under a physician's care or contacted a physician upon being notified by the Project Nurse.

Reactions to Finding Out of Illness

Those persons who indicated the CMI had suggested they might have an illness were asked to respond to a question as to how they felt when they were told they may have an illness. They were asked to respond in terms of the four categories: (1) you already knew you had it," (2) you were glad to learn about it," (3) you were not sure how you felt," and (4) you wish you had not found out."

In five cases, the question was not asked, primarily because these were cases where the person already knew they had the illness and the interviewersthought that there was no need to ask. However, these five cases cannot be rightfully placed with the "already knew" responses since they may have answered in one of the other categories. For the 22 cases in which it was asked, no one said they wished they had not found out. Fourteen said they already knew they had the illness. Eight said they were not sure how they felt, but in one case the participant said he was "surprised" and in another the additional response was " a little upset." One of the persons stating they already knew, said they were, nevertheless, "glad" to know again.

Opinions of Worthwhileness and Willingness to Participate Again

Seventy-three persons, or 78 percent of the 94 persons interviewed said they felt the CMI project was worthwhile. The remaining 21 persons said (1) it was not worthwhile or (2) they were not sure if it was worthwhile. The percentage approving the project indicates that there was a fairly high degree of acceptance of it.

The question of whether they would be willing to participate again, should the CMI be offered and should they still be with the Department, provides an even stronger indication of approval and acceptance. In answering the question 78 "positive" responses were obtained. This represents 83 percent of those interviewed. The "no" proportion was much higher here, though, with 13 saying "no" and 3 expressing uncertainty. It was frequently mentioned by some persons that although they themselves would not participate again, they did think the project was worthwhile for those persons who did not visit a doctor for checkups, either because of financial or availability reason. This is probably the biggest explanation for the stronger "no" responses in the question of willingness to participate again.

Willingness to Pay for Prevention

The last question asked in the interview was whether the respondent would be willing to pay for preventive services designed to uncover any illness the respondent might have. The question, as asked, proved to be difficult to handle since many times the respondent's first words were "what do you mean?" The question did not ask for the reaction to specific preventive measures but interviewers found they had to state that they meant such things as screening, annual physician checkups, etc.

Since each interviewer may have suggested different things, there is difficulty in interpreting the responses. Persons may have been, most likely were, responding to a different stimulus.

The responses to the question of whether they would be willing to pay for preventive services follows: "yes" - 56 (60%); "no" - 19 (20%) and "don't know" or "maybe" - 19 (20%). Comments of respondents indicated money rather than a negative attitude might be an important factor. Those with jobs paying lower incomes seemed less likely to say yes or maybe than those at higher income levels.

EVALUATION OF EDUCATIONAL VALUE OF CORNELL MEDICAL INDEX

Introduction

One objective of the project was a determination of the educational value of the Cornell Medical Index (CMI) form. The underlying hypothesis here was that those persons filling out the CMI form would be more likely to have a change in attitude towards the importance of preventive behavior than those not filling out a CMI form.

Underlying the hypothesis was the assumption that completion of the CMI is an evaluation of personal health done in part by the individual. Such self-completion of a form represents a degree of involvement in looking at one's health which is not usually found. As a consequence of such involvement in self-examination, it would seem logical to expect a change toward a more positive attitude towards the importance of preventive behavior.

Selection of Control Group

To attain the above objective of attitude change, attitude measures had to be made before the CMI project was undertaken and after the program was completed. One set of measures had to be made on the group receiving the CMI form (experimental group) and another set had to be made on another group not receiving the CMI (control group). Consultation with biostatisticians revealed that a control group of 500 persons would probably be adequate to allow for refusals, personnel turnover and provide an adequate number for analysis. It was decided that the control group should be a group which has a prevention oriented mission. This would help offset any changes that might be due to the prevention oriented mission of the State Health Department. It should also be located in Harrisburg so as to minimize the cost of collecting data.

The Bureau of Traffic Safety in the Pennsylvania Department of Revenue is a State agency having the mission of developing methods for insuring the public safety on the highways of Pennsylvania. At the time the study was started, the Bureau employed about 600 persons. The Bureau Director consented to use of the Bureau as a control group and plans were made to include it in the study.

The Questionnaire

Copies of the questionnaires used before and after administration of the CMI form are presented on pages 53-56. The questionnaire used before the administration of the CMI was considerably longer than that used after. This was due to the need to collect background characteristics on individuals which might ultimately be used in explaining variations in attitude change. Questions dealt with many facets of health attitudes, knowledge and behavior.

Field Procedure

Before CMI - For Health Department employees, the questionnaires were explained and administered before the CMI's were distributed. This was done in order to obtain responses to the questions without being influenced by the nature of the CMI. However, as was indicated in an earlier section on administration of the CMI, some individuals took the materials along with them and completed them at their desk. Nevertheless, the questionnaires were completed and turned in before the individual learned the results of the CMI.

In the Bureau of Traffic Safety, attempts were made to have the project research staff administer the questionnaires with explanations, but persons in the Bureau of Traffic Safety who were assigned to the project preferred to distribute the questionnaires and collect them upon completion.

The questionnaires were distributed to Traffic Safety employees in February, 1968 and collected the same month. In the Health Department, the questionnaires were administered at the same time as the CMI form.

After CMI - The last of the CMI forms and the first round of questionnaires were administered to Health Department employees in June, 1969. In July, 1969, the one-page follow-up questionnaire was distributed to Health Department employees. This was done by putting the questionnaire and an explanatory note in an envelope and sending it to each employee who had participated the first time. Those not participating the first time were excluded since there would be no "before" measure of attitude to which to compare the "after" measure. The questionnaires sent out in July were returned during July and August.

For the Bureau of Traffic Safety, the questionnaires were distributed in August and returned in September, 1969.

Response Rate

Only summary tabulations were made for purposes of this report. All data were coded and put on punch cards but at this writing, only summary analyses have been made and are herein presented.

Before presenting reports of any tabulations a note should be made on Health Department employees included in analysis. As indicated in an earlier section, in which the CMI form was discussed, the project staff administering the CMI forms (and attitude questionnaires) had considerable difficulty explaining the forms to and obtaining completions from many of the less educated employees at the institutions. In many instances, ability to comprehend was so minimal that there was only time to complete the CMI form. Because of this problem of inability to read and comprehend, completion of questionnaires was sporadic. Rather than attempt to use such data, it was decided to restrict analysis of attitude change to employees of Central Office, the Region, and the Elizabethtown Crippled Children's Hospital (ECCH). (Problems of interpretation were less at the latter institution than at other institutions).

The reader, then, needs to keep in mind two major limitations in interpreting the results presented below:

(1) Follow-up questionnaires were mailed only to those persons who participated in the first stage, and

(2) Only employees in Central Office, the Regions and the Elizabethtown Crippled Children's Hospital are included.

A distribution of the participants in these four settings according to response status in the follow-up is given in Table 1. The number not completing is rather large as will be noted in Table 1 (29 percent of

Health employees and 33 percent of Traffic Safety employees). This is due primarily to the fact that no follow-up contact was made because of limited manpower. This incomplete response rate is a third limitation to keep in mind in interpreting analytical tables which follow.

For the remainder of the report only those cases included in the category "Questionnaires obtained in follow-up" will be considered since these are the ones on which both before and after measurements were available.

Two questions were used to obtain a measure of change in attitude toward prevention. One was: "How important do you think it is for a person to go to a doctor for a checkup on a periodic basis, even though there does not appear to be anything wrong with him?" The response categories were: "Very important--fairly important--little importance--no importance." This was Question No. 1 on the first questionnaire and No. 7 on the second one. "Very important" represents the most desirable response.

The second question used in measuring attitude change was: "How much do you agree or disagree with the following statement: "A person should go to a doctor only for treatment for some ailment; that is, only when he is in pain or is very sick." This was No. 3 on the first questionnaire and No. 8 on the second. The response categories were: "Agree very much--agree some--disagree some--and disagree very much." "Disagree very much" represents the most desirable response.

Distributions of before and after responses to each question are given in Tables 2 and 3. It is clear that for both questions, there is a concentration of responses in the more desirable response category. This concentration is greater for that concerned with periodical visits to the physician than for the other question.

Table 4 contains information on changes in attitudes among the respondents for the item on periodical visits to the physician. The three Health Department groups taken together have only a slightly higher percentage of upward changes than the Control group. This higher percentage is due solely to the Regional group since the Central Office and Hospital groups were lower than the Control group.

Downward changes were more prevalent among the Control group than among any of the Health Department groups. The percentage of "no change" was considerably lower in the Control Group (9.8 vs. 22.5 percent). When we consider the extent to which the most desirable response existed before and after, we find the Control group was about 11 percent higher than the Health group (62.0 vs. 50.7 percent).

In Table 5, data are presented on the extent to which there was a change in attitude toward visiting physician only for pain or sickness. In this case, both the upward and downward changes were greater for the Control group (29.4 vs. 24.8 percent and 19.3 vs. 14.7 percent). The Control group also had a higher percentage of no change (16.3 vs. 14.1 percent). However, in contrast to the finding in Table 5, the Control group had a much lower percentage of respondents who started and ended in the more desirable response category (35.0 vs. 46.4 percent).

The results of the two analyses indicate there may well have been differences in nature of the questions and the interpretations given to them. The first question makes no reference to sickness but rather emphasizes the checkup aspect of physician visits. The second emphasizes treatment of sickness and pain but does not mention checkup.

More detailed and controlled analysis of responses may reveal that other variables may be influencing the preliminary results presented here. One variable, for example, on which the four groups were found to be different was years of school completed.

In Table 6, the groups are compared by years of school completed. The percentage of respondents in the Control group completing more than 12 years of school is very much lower than the Health groups taken together (56.5 vs. 20.3 percent). Nearly all of the Regional and Control office personnel had completed 12 years or more of school. Educational levels were somewhat lower at the hospital.

There may well be other variables on which there are differences among the groups and which may make differences in the quantity and kind of changes in attitude. But with the limited analyses presented here, it appears that the administration of the CMI did not bring any significant upward changes in attitude. There is some evidence, however, that administration of the form did reduce downward change.

TABLE 1 - Distribution of Participants in First Phase According to Follow-up Status

Follow-up Status	Department of Health				Control
	Central Office	Region	ECCH	Total	
Initial No. of Participants	435	741	146	1,322	568
Resigned or Transferred	54	62	1	117	59
Not completed Second Time	128	197	56	381	188
Questionnaires obtained in follow-up	253	482	89	824	321

TABLE 2 - Distribution of Before and After Responses on Attitude Toward Importance of Periodical Visits to Doctor

Department of Health

Responses	Central Office		Region		ECCH		Control	
	B	A	B	A	B	A	B	A
Very important	150	161	289	298	55	56	232	235
Fairly important	96	81	164	155	29	24	74	66
Little importance	4	4	22	21	2	7	5	7
No importance	1	5	1	2	2	1	4	7
Total*	251	251	476	476	88	88	315	315

*No information for 14 cases.

TABLE 3 - Distribution of Before and After Responses on Attitude Toward Going to Doctor Only for Treatment of Pain or Sickness

Department of Health

Responses	Central Office		Region		ECCH		Control	
	B	A	B	A	B	A	B	A
Agree very much	6	11	13	7	7	4	44	27
Agree some	39	26	71	38	10	14	46	46
Disagree some	79	68	108	106	20	26	68	59
Disagree very much	127	146	287	328	50	43	156	182
Total*	251	251	479	479	87	87	314	314

* No information for 14 cases.

TABLE 4 - Percentage Distribution of Respondents According to Change in Attitude Toward Importance of Periodical Visits to Doctor

Type of Change	Central Office	Region	ECCH	Total	Control
		-----Percent-----			
Change up	13.1	15.5	11.4	14.4	14.0
Change down	10.4	13.6	12.6	12.4	14.3
No change	24.7	21.4	21.6	22.5	9.8
At most desirable level before and after	51.8	49.5	54.4	50.7	62.0
Total	100.0	100.0	100.0	100.0	100.0
N*	251	476	88	815	315

* No information for 15 cases.

TABLE 5 - Percentage Distribution of Respondents According to Change in Attitude Toward Going to Doctor Only for Treatment of Pain or Sickness

Type of Change	Department of Health Central Office	 Region	 ECCH	 Total	Control
	-----Percent-----				
Change up	24.4	25.9	20.6	24.8	29.4
Change down	16.3	12.1	24.1	14.7	19.3
No change	17.5	11.5	18.4	14.1	16.3
At most desirable level *before* and *after*	41.8	50.5	36.9	46.4	35.0
Total	100.0	100.0	100.0	100.0	100.0
N*	251	479	87	817	314

* No information for 14 cases.

TABLE 6 - Percentage Distribution of Experimental and Control Respondents According to Highest Year of School Completed

Years of School Completed	Department of Health				
	Central Office	Region	ECCH	Total	Control
	------Percent------				
More than 12	37.9	71.7	34.5	56.6	20.3
12	54.8	27.3	44.1	38.2	59.0
Less than 12	7.3	1.0	21.4	5.3	20.7
Total	100.0	100.0	100.0	100.0	100.0
N*	427	732	145	1304	561

*Incomplete information in 25 cases.

BEFORE

HEALTH ATTITUDE SURVEY

This is a survey to determine people's beliefs, attitudes and behavior regarding various health activities. We would very much appreciate your filling out this questionnaire. It is important that you check what you really believe or do rather than what you feel it is proper to believe or proper to do. This information will be kept strictly confidential and used for health research analyses only. Only the research staff of the project will have access to the information provided.

Your name (print) ______________________________ Your age last birthday ___

Circle if you are ... Single, Married, Widowed, Separated, Divorced

Circle the highest grade you completed in school ... /1 2 3 4 5 6 7 8/ /9 10 11 12/

College - highest degree received _____

Other training, type and years completed __________

What is your job title? ______________________________

1. How important do you think it is for a person to go to a doctor for a check-up on a periodic basis, even though there does not appear to be anything wrong with him?

Very important ___ Fairly important ___ Little importance ___ No importance ___

2. Do you think check-ups are more valuable for certain age groups than for others? Yes ___ No ___

IF YOU CHECKED YES, PLEASE ANSWER QUESTION 2a.
IF YOU CHECKED NO, PLEASE ANSWER QUESTION 2b.

2a. For which of the following age groups do you think check-ups are most valuable? (You may check as many as you feel are appropriate.)

Less than 6 years ___
6 - 18 ___
18 - 45 ___
45 - 64 ___
65 and over ___

2b. Do you feel they are valuable for all age groups or none?

For all age groups ___ For no age group ___

3. How much do you agree or disagree with the following statement?

"A person should go to a doctor only for treatment of some ailment: that is, only when he is in pain or is very sick."

Agree very much ___ Agree some ___ Disagree some ___ Disagree very much ___

4. How much do you agree with this statement?

"Illnesses are always going to be hitting a person and there's really not much he can do about preventing them."

Agree very much ___ Agree some ___ Disagree some ___ Disagree very much ___

5. How much would you appreciate knowing about illnesses you may have which you did not realize you had?

Very much ___ Some ___ A little ___ Not at all ___

6. In the past twelve months, have you had a physical exam or a check-up of any kind? Yes ___ No ___

IF YOU CHECKED YES, PLEASE ANSWER 6a AND 6b.
IF YOU CHECKED NO, PLEASE ANSWER 6c.

6a. Was this done in connection with some ailment or symptom bothering you, or was it a check-up without any specific purpose?

For an ailment ___ For general check-up ___

6b. From whom did you receive the check-up or exam?

___ Family doctor
___ Employee physician
___ Specialist other than family doctor

___ Other, please explain ___

6c. What was the major reason you did not go for an exam or a check-up in the past twelve months? ___

7. Are you presently immunized for any of the following diseases? Did you receive any immunization from the Employee Health Service?

	Yes	No	Don't Know	Received from Health Service?	
				Yes	No
Polio	___	___	___	___	___
Smallpox	___	___	___	___	___
Tetanus	___	___	___	___	___
Flu	___	___	___	___	___

8. Have you read about or heard about any public X-ray or diabetes screening programs? Did you participate in them?

	Heard or read about?		Participated?	
X-ray	Yes ___	No ___	Yes ___	No ___
Diabetes	Yes ___	No ___	Yes ___	No ___

9. In the past twelve months have you been to a dentist? Yes ___ No ___

IF YOU CHECKED YES, PLEASE ANSWER 9a.
IF YOU CHECKED NO, PLEASE ANSWER 9b.

9a. Did you go for a particular problem or for a general check-up?

Problem ___ General check-up ___

9b. What would you say is the major reason why you did not visit your dentist in the past twelve months? ___

___

10. How often do you usually brush your teeth?

(1) More than twice a day ___ (2) Twice a day ___ (3) Once a day ___

(4) About once a week ___ (5) Less often than once a week ___

11. Have you ever heard of or read about the Cornell Medical Index Health Questionnaire? Yes ___ No ___

12. In general, why do you think people might not go for physical exams or check-ups?

___

___

13. At the present time, are you (and your spouse and any children, if you are married) covered by any kind of insurance that would pay or help to pay hospitalization and doctor costs should you (or they) become ill enough to require this? Yes ___ No ___

IF YOU CHECKED YES, PLEASE ANSWER THE FOLLOWING:

Is it through the state Blue Cross-Blue Shield plan? Yes ___ No ___

14. Are you presently under the care of a physician for any type of illness? Yes ___ No ___

15. Do you have a regular family physician? Yes ___ No ___

AFTER
HEALTH ATTITUDE SURVEY

This is a survey to determine people's beliefs, attitudes and behavior regarding various health activities. We would very much appreciate your filling out this questionnaire. It is important that you CIRCLE WHAT YOU REALLY BELIEVE OR DO RATHER THAN WHAT YOU FEEL IT IS PROPER TO DO. This information will be kept STRICTLY CONFIDENTIAL and used for health research analyses only. Only the research staff of the project will have access to the information provided. (Please CIRCLE THE ONE (ONLY ONE) appropriate numbered response for each question.) Please make sure you answer all eight (8) questions.

1. How old were you on your last birthday?
   1 Less than 24
   2 24 - 44
   3 45 - 64
   4 65 or over

2. Are you: 1 Single 2 Married 3 Separated 4 Divorced 5 Widowed

3. What was the highest grade in school you completed?
   1 Less than 12 2 12 3 More than 12

4. Have you ever heard of or read about the Cornell Medical Index Health Questionnaire? 1 Yes 2 No

5. Please circle the number preceding the month AND year of your last general physical examination or check-up. (Do not include examinations obtained for a specific complaint, ailment or illness--only exams for a general check-up.)

	Month		Year
1	January-March	1	Before 1967
2	April-June	2	1967
3	July-September	3	1968
4	October-November	4	1969

6. How much do you agree with the following statement? "Illnesses are always going to be hitting a person and there's really not much he can do about preventing them."
   1 Very much
   2 Some
   3 A little
   4 Not at all

7. How important do you think it is for a person to go to a doctor for a check-up on a periodic basis, even though there does not appear to be anything wrong with him?
   1 Very important
   2 Fairly important
   3 Little importance
   4 No importance

8. How much do you agree or disagree with the following statement? "A person should go to a doctor only for treatment of some ailment: that is, only when he is in pain or is very sick."
   1 Agree very much
   2 Agree some
   3 Disagree some
   4 Disagree very much

Conclusions

Out of the total of 94 persons interviewed, there were five which deserve some special note. These are the five persons for whom the CMI revealed illnesses of which they were not previously aware. A total of 27 positives were found in the study but 22 of these were already aware of the problem and 14 of these were already under treatment.

The five who were completely unaware of their illness in a sense represent the real "payoff" of the CMI among the 94 persons interviewed. Evaluation of these "payoff" cases may help to demonstrate the true value of the CMI. In all cases the respondents were females. One of these cases, a young female, said she was found to have high blood pressure. She said that all her life she thought she had low blood pressure and that was why she felt as she did. She said she went to a physician as suggested and was surprised to find she had a rather elevated pressure level. The physician put her on medication which had brought the pressure down and by the time of the interview, she said the dosage had been increased because the pressure was rising again. She said she was highly thankful for the CMI because it helped her correct the problem.

In a second of the 5 cases, a middle-aged female did not visit the physician as advised. She said the CMI indicated she might have heart trouble. Several weeks after being told of the results of the CMI, she had a heart attack. In spite of this, she said, she still did not think the CMI could have really helped--"either you are going to get it or you aren't."

The above two cases show two opposite reactions to clearly identified problems.

In the other three cases, respondents did not identify specific diseases but their reactions are, nonetheless, worth reporting. One was a female who said her physician had always thought she was a hypochondriac and she did not go to him about the suspected problem because he probably would not pay any attention to her.

In the fourth case, the female involved said she went to her physician but neither she nor he were able to figure out what the problem was. This was not pursued by the interviewer but suggests a breakdown in communications somewhere between the patient, physician, and Project Nurse.

The fifth case involved a female who was reluctant to go to physicians. She did not deny the CMI may well have revealed something, but said that she did not know why but she hated "to go to doctors."

In the last four of the above five cases, there is rather strong support for the assertion that such a project as that conducted in this case might go beyond merely diagnosing and reporting illness. Encouragement and probing to understand why the suggested physician visit was not made was needed. Future work along this line should make some kind of plan for a counseling function.

INTERVIEW SCHEDULE FOR CMI PROJECT

During the past two years, the Bureau of Planning, Evaluation and Research has been conducting a project in which Health Department employees were asked to complete a personal health inventory form called the Cornell Medical Index (CMI). On the form were questions asking about symptoms of illness.

1. Do you recall being asked to complete the CMI? Yes __ No __ D.K. __
2. Did you complete a CMI form? Yes __ No __ D.K. __

IF YES, ASK QUESTIONS: 3 to 5

IF NO, ASK QUESTIONS: 6 to 8

ASK NO. 9 OF ALL RESPONDENTS.

FOR THOSE COMPLETING A CMI FORM

3. Do you recall having any difficulty in understanding any of the questions in the CMI form itself? Yes __ No __ D.K. __

IF YES, ASK: Do you recall any particular question or questions? What?

4. Did the CMI indicate that you might have a health problem or health problems?

Yes __ No __ D.K. __ Don't want to say __

IF YES IN NO. 4:

(a) Was this a health problem you were already aware of?

Yes __ No __ Some but not all __

IF YES OR SOME BUT NOT ALL:

(1) By whom was the problem originally diagnosed?

Self __ M.D. family doctor __ M.D. other than family doctor __

D.O., family doctor __ D.O. other than family doctor __

Some other person (specify) ______________________________

(2) Had you already been under treatment for this problem? Yes __ No __

(b) Did you contact a physician as suggested by the project nurse? Yes __ No __

Why?

IF YES, ASK:
Did the physician validate the problem indicated? That is, did he also feel this was a problem? Yes __ No __

(c) Are you now being treated for this problem? Yes __ No __

(d) What was your feeling when the project nurse told you that the CMI indicated you had a health problem? Would you say:

You already knew you had it ____

You were glad to learn about it ____

You were not sure how you felt ____

You wish you had not found out ____

IF NO IN NO. 4, ASK:

(a) Did you have a health problem which the CMI did not indicate you might have?

Yes __ No __

IF YES, ASK:

Had this problem been diagnosed by a physician? Yes __ No __

5. What would you say was the major reason or reasons why you consented to fill out the CMI? ______________________________

FOR THOSE NOT COMPLETING A CMI FORM

6. What was the major reason or reasons why you did not complete a CMI form?

____

7. Do you have any health or medical problems of any kind? Yes __ No __

IF YES:

(a) Are you under the care of a physician for this problem? Yes __ No __

(b) Was t is a reason why you didn't complete the CMI? Yes __ No __

8. Do you personally feel the CMI or any other similar self-completed personal medical or health inventory is worthwhile? Yes __ No __

Why? ______________________________

____

ASK OF ALL RESPONDANTS

9. If the CMI were administered to Department employees again, and you were still with the Department, do you think you would consent to completing one?

Yes __ No __ It depends on ____

Why?

V. SICK LEAVE STUDY

NON-PARTICIPANTS VS. PARTICIPANTS

The sick leave records of a sample of 300 Pennsylvania Department of Health employees were studied to determine if there were differences in the amount of sick leave taken by non-participating employees, employees with negative C.M.I's, and employees with positive C.M.I.'s.

It was felt that if the C.M.I. is a valid screening instrument it would be found that employees with positive tests would have taken more sick leave than those with negative tests, while non-participating employees who presumably included both healthy individuals and individuals with health problems would occupy a middle position.

The sample included 100 non-participants, 100 with negative C.M.I.'s, and 100 with positive C.M.I.'s. Individuals within each group were selected on a random basis utilizing a table of random numbers. The final sample consited of 111 males and 189 females. Thirty-nine percent of the Department of Health employees were males; 35.7 percent of the sample population were males.

The average annual number of days of sick leave was higher for females than males in every age group (Table V). Moreover, 36.5% of the females took 15 or more days sick leave while only 15.3% of the males used 15 or more sick days. By contrast 17.5% of the females took 0-4 days sick leave as compared to 36.9% of the males (Table V). Perhaps some of this discrepancy may be attributed to the fact that mothers may take time off from work to care for ill children.

As expected, employees, both male and female, with positive C.M.I. scores averaged more days sick leave per year than non-participating employees, while those with negative tests had the lowest average number of sick days (Table V). The figures for males are 10.0, 7.6, and 6.9 respectively, and for females they are 12.6, 11.3, and 10.2. In only one sex age category (female age 40-49) did employees with negative scores average more sick days than those with positive scores, and this was only 0.5 days. With regard to non-participating employees these results were not so consistent perhaps because of the mixed nature of the group.

Nearly half, 48.6% of the females with positive C.M.I. results took 15 or more days sick leave as compared to 30% for non-participating females and 28% for females with negative findings. 29% of the positive males and 11% of the non-participating and negative males missed 15 or more days work (Table V).

Among non-participating males and males with negative C.M.I. results there is an inverse relationship between the number of days sick leave taken and the proportion of males in each category. That is, as the number of days leave increases the proportion of males decreases. There is no clear pattern for males with positive C.M.I.'s.

Among females with positive C.M.I.'s, however, the proportion in each category increases as the number of days sick leave increases. Although the increases are relatively slght in the period 0-14 days. A rather consistent proportion of negative C.M.I. females occupy each of the four days sick leave categories in Table V 22-28%.

Although the data are not pure, the presence of factors other than personal illness are strongly suspected in the leave-taking habits of individuals. It appears that sick leave records do reflect C.M.I. scores.

AVERAGE NUMBER OF DAYS SICK LEAVE BY AGE, SEX, AND PARTICIPATION IN THE C.M.I. PROJECT

	BOTH SEXES				MALE				FEMALE			
AGE	Total	Non-Partici-pating	Negative C.M.I	Positive C.M.I	Total	Non-Partici-pating	Negative C.M.I.	Positive C.M.I.	Total	Non-Partici-pating	Negative C.M.I.	Positive C.M.I.
ALL AGES	10.1	9.6	9.0	11.9	8.0	7.6	6.9	10.0	11.4	11.3	10.2	12.6
UNDER 30	10.3	10.0	9.7	11.9	8.6	8.0	8.6	10.0	11.2	12.0	10.1	12.5
30-39	9.1	8.7	6.3	12.2	7.9	7.5	7.0	11.3	10.4	12.5	5.0	12.5
40-49	10.3	8.8	10.4	11.7	8.2	6.7	6.4	11.9	11.4	10.3	12.0	11.5
50-59	10.4	10.2	8.4	11.8	6.9	7.5	5.8	6.8	12.1	11.9	9.8	13.4
60 & OVER	10.1	10.2	7.5	11.9	9.0	10.0	5.0	10.0	10.8	10.4	8.8	13.8

TABLE V

VI. SUMMARY

I. Background

A study was conducted by the Pennsylvania Department of Health, Bureau of Planning, Evaluation and Research, to determine the effectiveness, cost, and feasibility of seeking undiagnosed cases of chronic illness among employees of the State Department of Health using the Cornell Medical Index as a screening device.

The effectiveness of the Cornell Medical Index has been validated in situations where the screening was on an involuntary basis--by the military, in industry, and in similar situations.

In this study participation on the part of employees was voluntary. No attempt at compulsion was attempted.

A follow-up study of 94 participants was done to attempt to determine the effect of screening on attitudes towards preventive examinations and to identify any common denominator attitudes favorable or unfavorable to the screening program.

The project was directed by the director of the Employee Health Service. The associate director was the director of the Bureau of Planning, Evaluation, and Research. The project supervisor was a full-time employee. Statistical services were provided by members of the staff of the Division of Research and Biostatistics. The attitudinal study was conducted by the director, Division of Behavioral Science and members of his staff.

Significant contributions to the project were made by the directors of other bureaus and divisions, heads of institutions, regional medical directors and their staffs. Without their help the study would not have been possible.

The success of the project depended on maintaining the confidentiality of all records. To accomplish this all participants were given an index number recorded on their name file. This master file was maintained in a locked filing cabinet to which only the project director and project supervisor had access.

In order to acquaint employees with the purpose of the study and to solicit their participation, meetings were held with bureau and division directors, heads of institutions and regional medical directors as the survey progressed.

Small groups of employees were then selected by supervisors and canvassed to determine their willingness to participate. Those who agreed to participate met with the project supervisor who explained the nature of the Cornell Medical Index, how to fill it out, and answered questions as they developed during the meeting. Copies of the Cornell Medical Index were then distributed to be filled out. The project supervisor remained to assist those who encountered problems.

In the case of county offices where the number of participating employees was small the project supervisor occasionally met with single individuals or with several employees at a time.

The greatest difficulty in understanding the questions was met among employees of institutions in the lower grades many of whom had not had extensive schooling.

II. Results

A. Participation

Of the 3,077 employees of the State Department of Health 2,076 (67.5%) participated in the study. Participation on the part of females (71.0%) was greater than of males (62.1%).

B. Percent Positive

Of the 2,076 employees who participated the CMI's of 428 (20.6%) suggested the possibility of chronic illness.

C. Physician Confirmation

Of the 428 employees with a positive CMI 150 were sent to physicians. 73 physicians returned the requested forms, and of these 65 physician returns confirmed the presence of disease suggested by the CMI questionnaire.

275 employees refused to permit the CMI findings to be sent to a physician.

However, 207 employees stated that they were aware of the suggested condition or were being treated for it.

D. Effectiveness

Obtaining a positive finding on a CMI does not constitute successful intervention in the course of a disease. Nor does the rediscovery of a disease or condition already known to the employee.

Therefore the effectiveness of this program must be evaluated on the basis of the number of employees who were found to have a positive CMI, who went to their physician as a direct result of the finding, and in whom the presence of a disease or condition previously undetected was found and confirmed by a physician examination.

From the data collected it may be seen that the attempt to discover previously undetected chronic conditions or diseases among State employees by the use of the CMI on a voluntary basis was relatively unsuccessful.

For example, in only 37 of 624 employees in the central office was a previously undetected chronic condition or disease found and confirmed; among 1,453 institutional employees only 20 were confirmed; and among 1,071 regional employees only 13 were confirmed cases.

III. Costs

The total cost of the study was $57,137.96. This included the prorated cost of the time contributed by supervisoors who participated to a significant degree in the survey. The contributed cost is relatively small since the survey was done only once in each health department unit and required only short periods of time.

Another cost that was included was the prorated cost of salaries of a biostatistician and several clerk-stenographers used for relatively short periods.

The cost of screening each of the 2,076 employees amounted to $27.50. The cost of finding each of the 428 employees with a positive CMI was $134.20.

In view of the serious nature of some of the diseases and conditions found these costs could be tolerated but for the fact that in the case of a number of employees with a positive CMI the employee already had a knowlege of the disease.

Another factor that makes the cost unacceptable is the relatively small percentage of employees with a positive CMI who agreed to have their records sent to a physician.

IV. Some Observations

A. There was a steady attrition among employees at all stages of the project:

Total number of employees - 3077

Number of participating employees - 2076

Number of positive CMI's - 428

Positive CMI's sent to physician - 150

Number of reports returned by physician - 73

Number of physician confirmation - 65

Only 2.1 percent of the total number of employees were induced to participate, were found to have positive CMI's, and went to a physician who confirmed the positive findings.

B. Basing the cost of finding one employee with a chronic disease or condition confirmed by a physician on the total cost of the program, this method of detecting chronic illness is economically unsound.

C. Noting the potential ability of the CMI to suggest the presence of chronic illness, its use on a mandatory basis for preemployment examinations could prove useful.

D. The CMI could also be effectively used in conjunction with periodic physical examinations involving employees who were cooperative and who sincerely desired to find out the state of their health.

E. The degree of participation of employees in the CMI project correlated with the attitude of their supervisors. Where a supervisor was cooperative, understood the value of research, and indicated this to employees under his or her supervision the participation rate was relatively high. In the case of uncooperative supervisors the converse was true.

F. A survey of 94 participants in the survey indicated that 74 felt participation in the project was worthwhile, 78 said they would again participate if it were conducted, and 56 were willing to pay for preventive services.

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